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TRANSMITTAL FORM

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First Named Inventor	Canella et al.
Group Art Unit	1725
Examiner Name	J. Johnson
Attorney Docket Number	2269-3481.1US (MUEI-0399.01/US)

ENCLOSURES (check all that apply)

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SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

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Date	April 28, 2005	

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Canella et al.

Serial No.: 10/007,125

Filed: December 4, 2001

For: LASER MARKING SYSTEM FOR
DICE CARRIED IN TRAYS AND
METHOD OF OPERATION

Confirmation No.: 4166

Examiner: J. Johnson

Group Art Unit: 1725

Attorney Docket No.: 2269-3481.1US

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BRIEF ON APPEAL

Mail Stop Appeal Brief – Patent
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sirs:

This brief is submitted in the format required under 37 C.F.R. § 41.37(c). A check in the amount of \$500.00 for the fee under 37 C.F.R. § 41.20(b)(1) for filing a brief in support of an appeal is enclosed.

1) REAL PARTY IN INTEREST

The real party in interest in the present pending appeal is Micron Technology, Inc., Assignee of the pending application as recorded with the United States Patent and Trademark Office on March 8, 1999, at Reel 9803, Frame 0396.

2) RELATED APPEALS AND INTERFERENCES

Neither the Appellants, the Appellants' representative nor the Assignee is aware of any pending appeal or interference which would directly affect, be directly affected by or have any bearing on the Board's decision in the present pending appeal.

3) STATUS OF THE CLAIMS

Claims 1 through 67 are pending in the application.

Claims 12 through 63 have been withdrawn from consideration as being drawn to a nonelected species. Applicants note that claims 12 through 63, which ultimately depend from claim 1, would be allowable if claim 1 is determined to be allowable.

Claims 1 through 11 and 64 through 67 stand rejected.

Claims 1 through 11 and 64 through 67 are the subject of the present pending appeal.

4) STATUS OF AMENDMENTS

No amendments have been proposed in the present application subsequent the rejection mailed November 30, 2004.

5) SUMMARY OF THE CLAIMED SUBJECT MATTER

Referring to FIGS. 1 through 5, 10 through 12, 15 and 16 of the as-filed application, the presently claimed invention is directed to a laser marking system 10 for marking integrated circuit (IC) packages 202. The system includes an input shuttle assembly 12, an output shuttle assembly 14 and a transport actuator 16 which may extend between the input shuttle assembly and the output shuttle assembly. A laser marking station 18 is disposed adjacent a portion of the transport actuator between the input shuttle assembly and the output shuttle assembly. (As-filed Application, ¶ [0034]).

A plurality of trays 200 may be stacked at the input shuttle assembly, the output shuttle assembly, or at both locations. Each tray may include structure, such as a rectangular array of recesses 204, to carry a plurality of packaged IC devices (or IC packages) 202. A singulated tray may be carried by a tray carrier 22 which, in turn is motivated by the transport actuator between the input and output shuttle assemblies. (*Id*, ¶ [0034]).

In one particular embodiment of the presently claimed invention, the tray carrier may be disposed on a tray transport 24 associated with the transport actuator without being secured thereto. An upper surface 96 of the tray transport and a lower surface 90 of the tray carrier may include mutually cooperative physical structures. For example, hemispherical recesses 92 formed in the lower surface of the tray carrier may be formed with a like radius and in the same positions as hemispherical bearings 94 which project upwardly from substantially planar upper surface 96 of tray transport 24. Such mutually cooperative physical structures may be adapted to align the tray carrier on the tray transport when the tray carrier is disposed thereon. Additionally, portions of the mutually cooperative physical structures may provide a fulcrum for tilting of the

tray and tray carrier relative to the tray transport. In one embodiment, the tray transport may be rectangular with the exception of a diagonal truncation or cutout 106 of the nearby corner of tray transport to further enhance the ability of the tray carrier and the trays to tilt relative to the tray transport. (*Id*, ¶¶ [0034], [0046] and [0047]).

The laser marking station 18 may employ a substantially bottomless enclosure 120 having four sides and a roof which does not require opening and closing of access shutters or other structures to admit a group of IC packages to be marked. A tray of unmarked IC packages positioned below enclosure 120 and residing on carrier tray, which in turn rests on tray transport of transport actuator, may be raised off of tray transport into an opening 122 defined in the bottom of enclosure by a lifting mechanism or device 60. For example, the tray and tray carrier may be raised off of the tray transport into the opening when contacted by parallel extensions 124 at the tops of side plates 80 of a lift structure 78. The upper ends 126 of extensions may include notched edges 128 that bracket a central protrusion 130 which is sized and located to closely fit within elongated side notches 132 of the tray carrier. In one embodiment, the lateral extent or width of tray transport is less than that of tray carrier so that side plates pass outboard of tray transport before extensions engage elongated side notches of tray carrier. Thus, for example, as shown in FIG. 16, when the lift structure of the lift mechanism is fully vertically extended, the tray carrier may be substantially contained within the enclosure and the tray located completely within the enclosure at a desired focal length for laser marking with the assurance that laser light emitted from the marking heads will be completely contained within enclosure. The tray carrier may be sized and shaped to act as a substantially light-tight closure to the bottom opening of the enclosure. Completion of the light-tight closure may be effected by the presence of the

extensions 124 in the elongated side notches 132, wherein the extensions 124 exhibit an adequate width to fill the width of notches 132. (*Id*, ¶ [0048]).

6) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1 through 11 and 64 through 67 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Brooks et al. (U.S. Patent No. 4,030,622) in view of Sauter et al. (U.S. Patent No. 5,911,461) as demonstrated by Delfino et al. (U.S. Patent No. 4,415,794).

7) ARGUMENTS

STANDARD OF PATENTABILITY UNDER 35 U.S.C. § 103(a)

Rejection of claims under 35 U.S.C. § 103(a) requires that the Patent and Trademark Office (hereinafter “the Office”) must first establish a *prima facie* case of obviousness. M.P.E.P. § 2142. The standard for establishing a *prima facie* case of obviousness is set forth in M.P.E.P. 706.02(j) where it states:

To establish a *prima facie* case of obviousness, three basic criteria must be met.

First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable

expectation of success must both be found in the prior art, and not based on Applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

In view of these standards, and the arguments set forth below, Appellants respectfully submit that the Office has not established a *prima facie* case of obviousness under 35 U.S.C. § 103(a).

A.1 PATENTABILITY OF CLAIM 1

In an Office Action mailed November 11, 2004, the Examiner rejected claim 1 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,030,622 to Brooks et al. (hereinafter "Brooks") in view of U.S. Patent No. 5,911,461 to Sauter et al. (hereinafter "Sauter") and U.S. Patent No. 4,415,794 to Delfino et al. (hereinafter "Delfino").

Independent claim 1 is directed to a system for marking integrated (IC) packages. The system comprises: *a plurality of trays, each tray being sized and configured to carry a plurality of discrete integrated circuit (IC) packages*; a transport actuator; *a tray carrier carried by, and unsecured to, the transport actuator for receiving at least one tray of IC packages of the plurality of trays*; an input shuttle assembly for providing the at least one tray of IC packages to the tray carrier; an output shuttle assembly for receiving the at least one tray of IC packages from the tray carrier; and a laser marking station disposed adjacent a portion of the transport actuator between the input shuttle assembly and the output shuttle assembly. Appellants submit that the combination of Brooks, Sauter and Delfino fails to teach or suggest all of the limitations of claim 1.

The Examiner cites Brooks as teaching a transport actuator for receiving trays of an IC package, an input and output shuttle assembly for providing the trays of IC packages to and from the tray carrier and a laser marking station disposed adjacent a portion of the transport actuator between the input and output shuttle assemblies. The Examiner cites Sauter as teaching a tray carrier unsecured to the transporter wherein an upper surface of the tray transport and a lower surface of the tray carrier include mutually cooperative physical structures. The Examiner then cites Delfino as disclosing the use of a laser for scanning a wafer.

The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device of Brooks to utilize a tray for the wafer in order to reduce the danger of damage thereto by reducing the surface area of the wafer contacting the carrier and, further, to modify the combined invention of Brooks and Sauter to utilize a laser in order to remove ion implantation damage. Appellants respectfully disagree.

In rejecting the claims, the Examiner asserts that Appellants may not rely on the recitation of an intended use to define over the cited references. However, Appellants note that combination of Brooks, Sauter and Delfino fails to render obvious the recited *structural configuration* of the presently claimed invention.

Considering the references relied upon by the Examiner, Brooks teaches a system of transporting and handling silicon wafers. (Brooks, col. 1, lines 6 - 7). While the Examiner has characterized Brooks as teaching a transport actuator for receiving trays of IC packages, Appellants submit that Brooks fails to teach or suggest a plurality of *trays*, each tray being sized and configured to carry *a plurality of discrete integrated circuit (IC) packages*. Nor does Brooks

teach a *tray carrier* which is carried by, and unsecured to, a transport actuator for receiving *trays of IC packages*.

Rather, Brooks teaches the loading of individual *wafers* (190) *directly onto a tongue* (210) in preparation for transporting the wafers along a vibratory track (30). A second tongue (210') assists in removal of the wafer from the track and into another cassette (214). (Col. 7, lines 5 - 39). Quite simply, *no tray or tray carrier is taught or suggested by Brooks*.

Appellants further submit that Sauter fails to teach a plurality of trays, each tray being sized and configured to carry a plurality of discrete integrated circuit (IC) packages. Also, contrary to the Examiner's assertion, Sauter fails to teach or suggest a *tray carrier* which is carried by, and unsecured to, a transport actuator for receiving at least one tray of IC packages of the plurality of trays.

Rather, Sauter teaches a *wafer carrier* configured to carry a *single wafer*, not a *tray* that is configured to carry a plurality of *discrete* IC packages. Appellants note that the term "discrete," as set forth in the Merriam-Webster Online Dictionary, is commonly viewed to mean:

1 : constituting a *separate entity* : *individually distinct* [and]

2 a : consisting of distinct or *unconnected elements*¹

Clearly, Sauter does not teach or suggest a tray that is sized and configured to carry a plurality of discrete integrated circuit packages. Again, Sauter simply teaches a *wafer carrier* sized and configured to carry a *single wafer*.

¹ Merriam Webster's Online Dictionary as visited at <http://www.m-w.com/cgi-bin/dictionary?book=Dictionary&va=discrete&x=11&y=12>, a copy of which is attached hereto in Appendix B.

Additionally, Sauter fails to teach or suggest a *tray carrier* in any form. While the Examiner asserts that Sauter teaches a *tray carrier*, no specific teaching is cited or relied upon by the Examiner. Clearly Sauter's wafer carrier may not be viewed as a tray carrier as recited in claim 1 of the presently claimed invention. Moreover, the only other component disclosed by Sauter (besides the *wafer* carrier) is a "guard ring 9" which inhibits the flow of deposition gas to the contact locations between the wafer and the wafer carrier. (See, e.g., col. 3, lines 14-39). Sauter does not teach or suggest in any way that the guard ring is useful as a *tray carrier*.

Delfino discloses a method of scanning the surface of a semiconductor wafer in a manner such that the laser beam never crosses the edge of the wafer. Delfino, however, fails to teach or suggest any sort of tray or tray carrier.

Appellants submit that, not only do Brooks, Sauter and Delfino fail to teach or suggest all of the limitations of claim 1 of the presently claimed invention, but there is also a lack of motivation to combine the references in the manner proposed by the Examiner. Furthermore, there is no reasonable expectation of success in combining the references as proposed by the Examiner.

Appellants note that Brooks teaches away from using either a *tray* or a *tray carrier* (both of which are recited by claim 1 of the presently claimed invention) in its transport system. In discussing the existing state of the art, Brooks states that various techniques have previously been utilized to transport wafers into and out of sealed vacuum chambers including "rotary carousels, endless conveyor belts, *movable carriages*, etc." (Col. 1, lines 41 - 43, emphasis added). Brooks states that such techniques are inadequate because "the *carriage element*" (i.e., the carrier), "must at some point penetrate the housing of the chamber, and the penetration points

must therefore be sealed so as to isolate the chamber from its ambient environment." (Col. 1, lines 44 - 47). In addressing this issue, Brooks teaches the sequential transport of wafers, without any extraneous carrier mechanism, along a defined path into the sealed chamber.

By transporting a single wafer at a time without *either a tray or a tray carrier*, Brooks teaches that it is easier to seal the air-tight chamber. In other words, use of a tray to carry the wafer would make it more difficult to seal the air-tight chamber. Logically, using both a *tray and a tray carrier* would make it even more difficult to seal the air-tight chamber. In sum, placing the wafer in any type of tray (e.g., the wafer carrier of Sauter), tray carrier, or both, for transport in the system disclosed by Brooks would render the system inadequate for its intended purpose and defeat the design of the Brooks system. As such, one of ordinary skill in the art would clearly avoid using any kind of tray or tray carrier (including the wafer carrier of Sauter) with the system of Brooks.

Considering the explicit teachings of Sauter, the carrier is explicitly described to support the *wafer* (not a plurality of discrete IC packages) from therebeneath so as to avoid contact with the outer periphery or upper surface of the wafer. Sauter describes the wafer carrier as contacting the wafer "below an imaginary center plane 7 which is situated in the center of the wafer between the flat front side 5 and the flat rear side 6 of the semiconductor wafer." (Sauter, col. 2, lines 56 - 59). Sauter teaches that this arrangement allows the wafer to be "coated in a reactor without the disadvantage that the coating is impaired at the rim of the front side by the presence of the carrier." (Sauter, col. 2, lines 60 - 62).

Referring back to Brooks, Brooks teaches that the transport of wafers involves placing the wafers on a track which is "forced to undergo small amplitude vibrations" and that such

vibrations have “a first displacement component perpendicular to the track which *repetitively lifts wafers momentarily out of contact with the track*, and a second displacement component directed long the track which advances the wafers along the track by a minute amount each time they are lifted off the track.” (Brooks, col. 3, 27-35, emphasis added). Aside from the fact that Brooks expressly teaches away from using a tray or tray carrier, it would be senseless to use the wafer carrier of Sauter with the system of Brooks since Brooks’ vibratory track would cause shaking and displacement of the both the wafer and carrier relative to the transport mechanism and, more importantly, because Sauter’s carrier only contacts an associated wafer along a lower peripheral edge thereof, such would cause shaking and displacement of the wafer relative to Sauter’s carrier during transport.

One of ordinary skill in the art would clearly recognize that such a combination would result in the wafer becoming unseated from Sauter’s wafer carrier if both the wafer carrier and its associated wafer were both to be placed on Brooks’ vibratory track. This alone would prevent one of ordinary skill in the art from combining the teachings of Brooks with Sauter.

Additionally, the system of Brooks includes a platen (120) which is rotated in order to place a wafer in a vertical position for processing purposes. (Col. 6, lines 34 - 38). The wafer carrier of Sauter is simply not constructed to retain a wafer in any position except the horizontal arrangement disclosed thereby. Use of Sauter’s wafer carrier in a position that is rotated substantially 90° from that disclosed by Sauter would clearly result in the wafer sliding off of the carrier resulting in damage to the wafer (and probably to Brooks’ system). Thus, there is clearly no motivation to combine the wafer carrier of Sauter with the system of Brooks. Nor is there a reasonable expectation of success in combining the references as proposed by the Examiner.

It is noted that the Examiner's stated motivation for combining Brooks and Sauter is to "reduce the danger of damage" to the wafer by reducing the surface area contacting the wafer. (See, Office Action, page 3). However, this stated motivation is negated by the fact that the vibratory track of Brooks' system would cause a wafer to be uncontrollably bounced around and jostled relative to the Sauter's wafer carrier, likely resulting in considerable damage to the wafer.

It is clear that the Examiner's proposed combination of references would not result in an operable system without substantial modification to either the system of Brooks or the carrier of Sauter – such modifications being contrary to the explicit teachings of the references. Indeed modification of Sauter's wafer carrier to hold an associated wafer during vibrational transport or rotation of the carrier and wafer through a 90 degree change in orientation would render the wafer carrier inadequate for its intended purpose.

Thus, Appellants submit that Brooks, Sauter and Delfino fail to teach and suggest all of the limitations of claim 1 of the presently claimed invention, that there is a lack of motivation to combine the references, and that there is no reasonable expectation of success in combining Brooks and Sauter as proposed by the Examiner.

As such, Appellants respectfully submit that claim 1 is allowable over the prior art relied upon by the Examiner and respectfully request that the rejections under 35 U.S.C. § 103(a) be reversed.

A.2 PATENTABILITY OF CLAIM 2

In the Office Action mailed November 11, 2004, the Examiner rejected claim 2 under 35 U.S.C. § 103(a) as being unpatentable over Brooks, Sauter and Delfino. Claim 2 depends from independent claim 1.

In addition to the arguments set forth above in section A.1 regarding independent claim 1, from which claim 2 depends, Appellants submit that Brooks, Sauter and Delfino fail to teach or suggest a *tray transport* having the *tray carrier* disposed thereon without securement thereto. In other words, claim 2 requires a tray received by a tray carrier which is disposed on the tray transport as part of the transport actuator.

As such, Appellants respectfully submit that claim 2 is allowable over the prior art relied upon by the Examiner and respectfully request that the rejections under 35 U.S.C. § 103(a) be reversed.

A.3 PATENTABILITY OF CLAIM 3

In the Office Action mailed November 11, 2004, the Examiner rejected claim 3 under 35 U.S.C. § 103(a) as being unpatentable over Brooks, Sauter and Delfino. Claim 3 depends from independent claim 1 via claim 2.

In addition to the arguments set forth above in section A.1 regarding independent claim 1, from which claim 3 depends, (as well as the arguments set forth in section A.2 regarding intervening claim 2), Appellants submit that Brooks, Sauter and Delfino fail to teach or suggest that the upper surface of a *tray transport* and a lower surface of a *tray carrier* have mutually cooperative physical features. While the Examiner appears to cite Sauter as disclosing such

subject matter, Appellants submit that Sauter only discloses a *wafer carrier* having an edge which contacts a beveled edge of the *wafer* at a conformal angle which teaching fails to teach or suggest the subject matter set forth in claim 3 of the presently claimed invention. Nor can the ring guard (9) of Sauter (the only other component disclosed by Sauter) be viewed to teach or suggest the recited limitations.

As such, Appellants respectfully submit that claim 3 is allowable over the prior art relied upon by the Examiner and respectfully request that the rejections under 35 U.S.C. § 103(a) be reversed.

A.4 PATENTABILITY OF CLAIM 4

In the Office Action mailed November 11, 2004, the Examiner rejected claim 4 under 35 U.S.C. § 103(a) as being unpatentable over Brooks, Sauter and Delfino. Claim 4 depends from independent claim 1 via claims 2 and 3.

In addition to the arguments set forth above in section A.1 regarding independent claim 1, from which claim 4 depends, (as well as the arguments set forth in sections A.2 and A.3 regarding intervening claims 2 and 3), Appellants submit that the references relied upon by the Examiner fail to teach or suggest that the mutually cooperative physical structures are adapted to align the *tray carrier* on the *tray transport* when the tray carrier is disposed thereon.

As such, Appellants respectfully submit that claim 4 is allowable over the prior art relied upon by the Examiner and respectfully request that the rejections under 35 U.S.C. § 103(a) be reversed.

A.5 PATENTABILITY OF CLAIM 5

In the Office Action mailed November 11, 2004, the Examiner rejected claim 5 under 35 U.S.C. § 103(a) as being unpatentable over Brooks, Sauter and Delfino. Claim 5 depends from independent claim 1 via claims 2, 3 and 4.

In addition to the arguments set forth above in section A.1 regarding independent claim 1, from which claim 5 depends, (as well as the arguments set forth in sections A.2, A.3 and A.4 regarding intervening claims 2, 3 and 4), Appellants submit that the references relied upon by the Examiner fail to teach or suggest that portions of the mutually cooperative physical structures provide a fulcrum for *tilting* of the *tray carrier* with respect to the *tray transport*. While the Examiner generally cites Sauter as teaching such subject matter, Appellants fail to find any specific teaching. Furthermore, Appellants submit that if the wafer carrier of Sauter was tilted relative to any transport on which it may be disposed (although Sauter provides no teaching or suggestion of such) the wafer held thereby would likely slip off the carrier due to its configuration as discussed above. As such, Appellants submit that Sauter teaches away from the presently claimed invention.

As such, Appellants respectfully submit that claim 5 is allowable over the prior art relied upon by the Examiner and respectfully request that the rejections under 35 U.S.C. § 103(a) be reversed.

A.6 PATENTABILITY OF CLAIM 6

In the Office Action mailed November 11, 2004, the Examiner rejected claim 6 under 35 U.S.C. § 103(a) as being unpatentable over Brooks, Sauter and Delfino. Claim 6 depends from independent claim 1 via claims 2, 3, 4 and 5.

In addition to the arguments set forth above in section A.1 regarding independent claim 1, from which claim 6 depends, (as well as the arguments set forth in sections A.2, A.3, A.4 and A.5 regarding intervening claims 2, 3, 4 and 5), Appellants submit that the references relied upon by the Examiner fail to teach or suggest that the *tray transport* is rectangular, but for a corner severed therefrom adjacent the fulcrum. While the Examiner points to FIG. 4 of Sauter, Appellants fail to find such subject matter disclosed thereby.

As such, Appellants respectfully submit that claim 6 is allowable over the prior art relied upon by the Examiner and respectfully request that the rejections under 35 U.S.C. § 103(a) be reversed.

A.7 PATENTABILITY OF CLAIM 7

In the Office Action mailed November 11, 2004, the Examiner rejected claim 7 under 35 U.S.C. § 103(a) as being unpatentable over Brooks, Sauter and Delfino. Claim 7 depends from independent claim 1 via claims 2, 3, 4, 5 and 6.

In addition to the arguments set forth above in section A.1 regarding independent claim 1, from which claim 7 depends, (as well as the arguments set forth in sections A.2, A.3, A.4, A.5 and A.6 regarding intervening claims 2, 3, 4, 5 and 6), Appellants submit that the references

relied upon by the Examiner fail to teach or suggest a lifting device extendable to contact the *tray carrier* at a location remote of the fulcrum.

As such, Appellants respectfully submit that claim 7 is allowable over the prior art relied upon by the Examiner and respectfully request that the rejections under 35 U.S.C. § 103(a) be reversed.

A.8 PATENTABILITY OF CLAIM 8

In the Office Action mailed November 11, 2004, the Examiner rejected claim 8 under 35 U.S.C. § 103(a) as being unpatentable over Brooks, Sauter and Delfino. Claim 8 depends from independent claim 1 via claims 2, 3, 4 and 5.

In addition to the arguments set forth above in section A.1 regarding independent claim 1, from which claim 8 depends, (as well as the arguments set forth in sections A.2, A.3, A.4 and A.5 regarding intervening claims 2, 3, 4 and 5), Appellants submit that the references relied upon by the Examiner fail to teach or suggest that the *tray transport* is of lesser longitudinal extent than the *tray carrier*.

As such, Appellants respectfully submit that claim 8 is allowable over the prior art relied upon by the Examiner and respectfully request that the rejections under 35 U.S.C. § 103(a) be reversed.

A.9 PATENTABILITY OF CLAIM 9

In the Office Action mailed November 11, 2004, the Examiner rejected claim 9 under 35 U.S.C. § 103(a) as being unpatentable over Brooks, Sauter and Delfino. Claim 9 depends from independent claim 1 via claims 2, 3, 4, 5 and 8.

In addition to the arguments set forth above in section A.1 regarding independent claim 1, from which claim 9 depends, (as well as the arguments set forth in sections A.2, A.3, A.4, A.5 and A.8 regarding intervening claims 2, 3, 4, 5 and 8), Appellants again submit that the references relied upon by the Examiner fail to teach or suggest that the *tray transport* is rectangular, but for a corner severed therefrom adjacent the fulcrum.

As such, Appellants respectfully submit that claim 9 is allowable over the prior art relied upon by the Examiner and respectfully request that the rejections under 35 U.S.C. § 103(a) be reversed.

A.10 PATENTABILITY OF CLAIM 10

In the Office Action mailed November 11, 2004, the Examiner rejected claim 10 under 35 U.S.C. § 103(a) as being unpatentable over Brooks, Sauter and Delfino. Claim 10 depends from independent claim 1 via claims 2, 3, 4, 5 and 8.

In addition to the arguments set forth above in section A.1 regarding independent claim 1, from which claim 10 depends, (as well as the arguments set forth in sections A.2, A.3, A.4, A.5 and A.8 regarding intervening claims 2, 3, 4, 5 and 8), Appellants again submit that the references relied upon by the Examiner fail to teach or suggest a lifting device extendable to contact the *tray carrier* at a location remote of the fulcrum.

As such, Appellants respectfully submit that claim 10 is allowable over the prior art relied upon by the Examiner and respectfully request that the rejections under 35 U.S.C. § 103(a) be reversed.

A.11 PATENTABILITY OF CLAIM 11

In the Office Action mailed November 11, 2004, the Examiner rejected claim 11 under 35 U.S.C. § 103(a) as being unpatentable over Brooks, Sauter and Delfino. Claim 11 depends from independent claim 1 via claims 2, 3, 4, 5, 8 and 10.

In addition to the arguments set forth above in section A.1 regarding independent claim 1, from which claim 11 depends, (as well as the arguments set forth in sections A.2, A.3, A.4, A.5, A.8 and A.10 regarding intervening claims 2, 3, 4, 5, 8 and 10), Appellants submit that the references relied upon by the Examiner fail to teach or suggest a lifting device which is extendable from a location below the *tray carrier* and adjacent a longitudinal end of the *tray transport*.

As such, Appellants respectfully submit that claim 11 is allowable over the prior art relied upon by the Examiner and respectfully request that the rejections under 35 U.S.C. § 103(a) be reversed.

A.12 PATENTABILITY OF CLAIM 64

In the Office Action mailed November 11, 2004, the Examiner rejected claim 64 under 35 U.S.C. § 103(a) as being unpatentable over Brooks, Sauter and Delfino. Claim 64 depends from independent claim 1.

In addition to the arguments set forth above in section A.1 regarding independent claim 1, from which claim 64 depends, Appellants submit that the references relied upon by the Examiner fail to teach or suggest a *tray carrier* which is substantially rectangular and includes a substantially planar upper surface having upwardly extending stops at each corner thereof. While the Examiner points to FIG. 4 of Sauter, Appellants fail to find such subject matter disclosed thereby.

As such, Appellants respectfully submit that claim 64 is allowable over the prior art relied upon by the Examiner and respectfully request that the rejections under 35 U.S.C. § 103(a) be reversed.

A.13 PATENTABILITY OF CLAIM 65

In the Office Action mailed November 11, 2004, the Examiner rejected claim 65 under 35 U.S.C. § 103(a) as being unpatentable over Brooks, Sauter and Delfino. Claim 65 depends from independent claim 1 via claim 64.

In addition to the arguments set forth above in section A.1 regarding independent claim 1, from which claim 65 depends, (as well as the arguments set forth in section A.12 regarding intervening claim 64), Appellants submit that the references relied upon by the Examiner fail to teach or suggest a *tray carrier* which includes a portion of reduced width defined by mutually longitudinally coextensive elongated notches in parallel sides thereof. While the Examiner points to FIG. 4 of Sauter, Appellants fail to find such subject matter disclosed thereby.

As such, Appellants respectfully submit that claim 65 is allowable over the prior art relied upon by the Examiner and respectfully request that the rejections under 35 U.S.C. § 103(a) be reversed.

A.14 PATENTABILITY OF CLAIM 66

In the Office Action mailed November 11, 2004, the Examiner rejected claim 66 under 35 U.S.C. § 103(a) as being unpatentable over Brooks, Sauter and Delfino. Claim 66 depends from independent claim 1 via claims 64 and 65.

In addition to the arguments set forth above in section A.1 regarding independent claim 1, from which claim 66 depends, (as well as the arguments set forth in sections A.12 and A.13 regarding intervening claims 64 and 65), Appellants submit that the references relied upon by the Examiner fail to teach or suggest a *tray carrier* which includes a plurality of downwardly facing notches in the two parallel sides thereof. While the Examiner points to FIG. 4 of Sauter, Appellants fail to find such subject matter disclosed thereby.

As such, Appellants respectfully submit that claim 66 is allowable over the prior art relied upon by the Examiner and respectfully request that the rejections under 35 U.S.C. § 103(a) be reversed.

A.15 PATENTABILITY OF CLAIM 67

In the Office Action mailed November 11, 2004, the Examiner rejected claim 67 under 35 U.S.C. § 103(a) as being unpatentable over Brooks, Sauter and Delfino. Claim 67 depends from independent claim 1 via claims 64, 65 and 66.

In addition to the arguments set forth above in section A.1 regarding independent claim 1, from which claim 67 depends, (as well as the arguments set forth in sections A.12, A.13 and A.14 regarding intervening claims 64, 65 and 66), Appellants submit that the references relied upon by the Examiner fail to teach or suggest that the plurality of downwardly facing notches in the *tray carrier* comprises two notches on each of the two parallel sides of the tray carrier. While the Examiner points to FIG. 4 of Sauter, Appellants fail to find such subject matter disclosed thereby.

As such, Appellants respectfully submit that claim 67 is allowable over the prior art relied upon by the Examiner and respectfully request that the rejections under 35 U.S.C. § 103(a) be reversed.

8) CLAIMS APPENDIX

A copy of claims 1 through 67 is appended hereto as “Appendix A.”

9) EVIDENCE APPENDIX

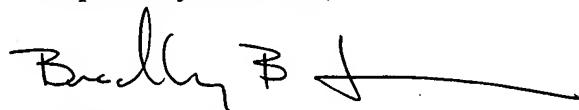
A copy of the following webpage regarding the definition of “discrete” is set forth in Appendix B in support of the foregoing arguments:

<http://www.m-w.com/cgi-bin/dictionary?book=Dictionary&va=discrete&x=11&y=12>,

CONCLUSION

Appellants respectfully submit that claims 1 through 67 are allowable over the prior art relied upon by the Examiner and respectfully request that the rejections under 35 U.S.C. § 103(a) be reversed.

Respectfully submitted,



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Telephone: 801-532-1922

Date: April 28, 2005

BBJ/dn

Document in ProLaw



APPENDIX A

Claims 1 through 67

U.S. Patent Application No. 10/007,125

Filed December 4, 2001

1. (Previously Presented) A system for marking integrated circuit (IC) packages comprising:
a plurality of trays, each tray being sized and configured to carry a plurality of discrete integrated circuit (IC) packages;
a transport actuator;
a tray carrier carried by, and unsecured to, the transport actuator for receiving at least one tray of IC packages of the plurality of trays;
an input shuttle assembly for providing the at least one tray of IC packages to the tray carrier;
an output shuttle assembly for receiving the at least one tray of IC packages from the tray carrier;
and
a laser marking station disposed adjacent a portion of the transport actuator between the input shuttle assembly and the output shuttle assembly.

2. (Original) The system of claim 1, wherein the transport actuator further includes a tray transport having the tray carrier disposed thereon without securement thereto.

3. (Original) The system of claim 2, wherein an upper surface of the tray transport and a lower surface of the tray carrier include mutually cooperative physical structures.

4. (Original) The system of claim 3, wherein the mutually cooperative physical structures are adapted to align the tray carrier on the tray transport when the tray carrier is disposed thereon.

5. (Original) The system of claim 4, wherein portions of the mutually cooperative physical structures provide a fulcrum for tilting of the tray carrier with respect to the tray transport.

6. (Original) The system of claim 5, wherein the tray transport is rectangular, but for a corner severed therefrom adjacent the fulcrum.

7. (Original) The system of claim 6, further including a lifting device extendable to contact the tray carrier at a location remote from the fulcrum.

8. (Original) The system of claim 5, wherein the tray transport is of lesser longitudinal extent than the tray carrier.

9. (Original) The system of claim 8, wherein the tray transport is rectangular, but for a corner severed therefrom adjacent the fulcrum.

10. (Original) The system of claim 8, further including a lifting device extendable to contact the tray carrier at a location remote from the fulcrum.

11. (Original) The system of claim 10, wherein the lifting device is extendable from a location below the tray carrier and adjacent a longitudinal end of the tray transport.

12. (Withdrawn) The system of claim 3, wherein the mutually cooperative physical structures comprise a plurality of substantially hemispherical protrusions on one of the tray transport and the tray carrier, and a plurality of substantially hemispherical recesses located and sized to receive at least portions of the substantially hemispherical protrusions on the other of the tray transport and the tray carrier.

13. (Withdrawn) The system of claim 12, wherein the substantially hemispherical protrusions extend upwardly from the upper surface of the tray transport and the substantially hemispherical recesses extend into the lower surface of the tray carrier.

14. (Withdrawn) The system of claim 13, wherein the tray carrier is of greater longitudinal extent than the tray transport, the tray transport is rectangular but for one corner truncated therefrom, the lower surface of the tray carrier includes an additional substantially hemispherical recess therein at a location beyond a longitudinal extent of the tray transport and proximate a longitudinal end of the tray transport opposite an end of the tray transport having the corner truncated therefrom, and further including a lifting device comprising an air cylinder having an element extendable upwardly therefrom to engage the additional substantially hemispherical recess and a substantially spherical protrusion on an end of the element sized to be received in the additional substantially hemispherical recess, the element being extendable to a degree to lift the tray carrier at the location of the additional substantially hemispherical recess.

15. (Withdrawn) The system of claim 14, further including a part movement facilitator located for contact with the tray carrier when the latter is in a lifted position.

16. (Withdrawn) The system of claim 15, wherein the part movement facilitator is selected from the group comprising a vibrator and a device configured for intermittent contact with the tray carrier.

17. (Withdrawn) The system of claim 1, wherein at least one of the input shuttle assembly and the output shuttle assembly comprises a frame defining a vertical, rectangular tray stack volume of like length and width dimensions to trays receivable in the tray carrier and a plurality of tray support element initiators mounted to the frame, each tray support element initiator having a tray support element extendable therefrom into the tray stack volume.

18. (Withdrawn) The system of claim 17, wherein the tray support element initiators comprise air cylinders.

19. (Withdrawn) The system of claim 18, wherein the tray support elements are biased to extend into the tray stack volume.

20. (Withdrawn) The system of claim 19, wherein the frame comprises four frame members, each including a vertically extending notch defining a corner of the tray stack volume, each of the frame members carrying a tray support element initiator.

21. (Withdrawn) The system of claim 20, wherein the notches of two of the frame members differ in depth from the notches of another two of the frame members, and the frame members are spaced so that, in combination with the differing notch depths, the frame is adapted to receive trays in only a single rotational orientation.

22. (Withdrawn) The system of claim 20, wherein the input shuttle assembly and the output shuttle assembly include like elements.

23. (Withdrawn) The system of claim 20, further including a vertically extendable and retractable lift mechanism located within the tray stack volume.

24. (Withdrawn) The system of claim 23, wherein the transport actuator extends from a tray stack volume of the input shuttle assembly to a tray stack volume of the output shuttle assembly, and the lift mechanisms are configured to engage and vertically move a tray located in the tray stack volumes without contacting a tray transport on which the tray carrier is disposed.

25. (Withdrawn) The system of claim 24, wherein each lift mechanism includes a horizontally movable drive wedge element having an inclined upper surface and a horizontally constrained slave wedge element having an inclined lower surface of like angle of inclination to that of the inclined upper surface.

26. (Withdrawn) The system of claim 25, further including a lift structure secured to the slave wedge element and extending upwardly therefrom.

27. (Withdrawn) The system of claim 26, wherein the lift structure further includes two substantially parallel side plates laterally spaced a greater distance than a width of the tray transport.

28. (Withdrawn) The system of claim 27, wherein the tray carrier includes a portion of reduced width and the side plates are located to extend vertically past the tray carrier proximate the reduced width portion.

29. (Withdrawn) The system of claim 26, wherein the slave wedge element is horizontally constrained by a bearing assembly permitting substantially only vertical movement of the lift structure.

30. (Withdrawn) The system of claim 29, wherein the drive wedge element is horizontally movable by an associated dual-action drive mechanism.

31. (Withdrawn) The system of claim 30, further including a dual-action stop mechanism configured and located to selectively limit travel of the drive wedge element.

32. (Withdrawn) The system of claim 30, wherein the dual-action drive mechanism comprises a dual-action air cylinder.

33. (Withdrawn) The system of claim 32, wherein the dual-action air cylinder comprises a drive block to which the drive wedge element is mounted, the drive block being slidable on at least one guide shaft.

34. (Withdrawn) The system of claim 33, further including a dual-action stop mechanism configured and located to selectively limit travel of the drive wedge element.

35. (Withdrawn) The system of claim 34, wherein the dual-action stop mechanism comprises a second dual-action air cylinder adjacent the drive block and having an extendable and retractable shaft.

36. (Withdrawn) The system of claim 35, wherein the extendable and retractable shaft is horizontally extendable and retractable and located in a same horizontal plane as the drive block.

37. (Withdrawn) The system of claim 1, wherein the transport actuator extends from the input shuttle assembly to the output shuttle assembly, passing under the laser marking station, and further including a vertically extendable and retractable lift mechanism located under the laser marking station.

38. (Withdrawn) The system of claim 37, wherein the lift mechanism is configured to engage and vertically move a tray carrier located under the laser marking station without contacting a tray transport on which the tray carrier is disposed.

39. (Withdrawn) The system of claim 38, wherein the lift mechanism includes a horizontally movable drive wedge element having an inclined upper surface and a horizontally constrained slave wedge element having an inclined lower surface of like angle of inclination to that of the inclined upper surface.

40. (Withdrawn) The system of claim 39, further including a lift structure secured to the slave wedge element and extending upwardly therefrom.

41. (Withdrawn) The system of claim 40, wherein the lift structure further includes two substantially parallel side plates laterally spaced a greater distance than a width of the tray transport.

42. (Withdrawn) The system of claim 41, wherein the tray carrier includes a portion of reduced width and the side plates include extensions thereon configured to engage the tray carrier at the portion of reduced width.

43. (Withdrawn) The system of claim 41, wherein the slave wedge element is horizontally constrained by a bearing assembly permitting substantially only vertical movement of the lift structure.

44. (Withdrawn) The system of claim 43, wherein the drive wedge element is horizontally movable by an associated dual-action drive mechanism.

45. (Withdrawn) The system of claim 44, wherein the associated dual-action drive mechanism comprises a dual-action air cylinder.

46. (Withdrawn) The system of claim 45, wherein the dual-action air cylinder comprises a drive block to which the drive wedge element is mounted, the drive block being slidable on at least one guide shaft.

47. (Withdrawn) The system of claim 1, wherein the laser marking station includes a substantially bottomless enclosure located above the transport actuator and at least one laser marking head housed within the enclosure.

48. (Withdrawn) The system of claim 47, further including a vertically extendable and retractable lift mechanism located under the laser marking station.

49. (Withdrawn) The system of claim 48, wherein the lift mechanism is configured to engage and vertically move the tray carrier when located on a tray transport under the laser marking station without contacting the tray transport.

50. (Withdrawn) The system of claim 49, wherein the lift mechanism includes a horizontally movable drive wedge element having an inclined upper surface and a horizontally constrained slave wedge element having an inclined lower surface of like angle of inclination to that of the inclined upper surface.

51. (Withdrawn) The system of claim 50, further including a lift structure secured to the slave wedge element and extending upwardly therefrom.

52. (Withdrawn) The system of claim 51, wherein the lift structure further includes two substantially parallel side plates laterally spaced a greater distance than a width of the tray transport.

53. (Withdrawn) The system of claim 52, wherein the tray carrier is substantially sized and shaped to correspond to an opening in the substantially bottomless enclosure of the laser marking station so as to provide a substantially light-safe closure for the opening when the tray carrier is inserted thereinto.

54. (Withdrawn) The system of claim 53, wherein the tray carrier includes a portion of reduced width defined by mutually longitudinally coextensive elongated notches in parallel sides thereof, and the side plates of the lift structure include extensions thereon configured to engage the tray carrier at the portion of reduced width, the extensions being sized to substantially prevent light leakage from the enclosure in a vicinity of the reduced width portion of the tray carrier.

55. (Withdrawn) The system of claim 54, further including at least one sensor associated with the enclosure for confirming presence of the tray carrier within the enclosure in a position effecting the substantially light-safe closure of the opening therein.

56. (Withdrawn) The system of claim 55, wherein the at least one sensor is responsive to a magnetic element located on the tray carrier.

57. (Withdrawn) The system of claim 52, wherein the slave wedge element is horizontally constrained by a bearing assembly permitting substantially only vertical movement of the lift structure.

58. (Withdrawn) The system of claim 57, wherein the drive wedge element is horizontally movable by an associated dual-action drive mechanism.

59. (Withdrawn) The system of claim 58, wherein the associated dual-action drive mechanism comprises a dual-action air cylinder.

60. (Withdrawn) The system of claim 59, wherein the dual-action air cylinder comprises a drive block to which the drive wedge element is mounted, the drive block being slidable on at least one guide shaft.

61. (Withdrawn) The system of claim 47, wherein the at least one laser marking head comprises at least two adjacent laser marking heads.

62. (Withdrawn) The system of claim 47, further including at least one inspection camera located between at least one of the input shuttle assembly and the laser marking station and the laser marking station and the output shuttle assembly.

63. (Withdrawn) The system of claim 62, wherein the at least one inspection camera comprises two inspection cameras, one between the input shuttle assembly and the laser marking station and one between the laser marking station and the output shuttle assembly.

64. (Original) The system of claim 1, wherein the tray carrier is substantially rectangular and includes a substantially planar upper surface having upwardly extending stops at each corner thereof.

65. (Original) The system of claim 64, wherein the tray carrier includes a portion of reduced width defined by mutually longitudinally coextensive elongated notches in parallel sides thereof.

66. (Previously Presented) The system of claim 65, wherein the tray carrier includes a plurality of downwardly facing notches in the two parallel sides thereof.

67. (Previously Presented) The system of claim 66, wherein the plurality of downwardly facing notches comprises two notches on each of the two parallel sides of the tray carrier.

APPENDIX B

**Copy of Merriam-Webster's Online Dictionary Regarding Definition of
Discrete**

U.S. Patent Application No. 10/007,125

Filed December 4, 2001

Merriam-Webster Online

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One entry found for **discrete**.

Main Entry: **dis·crete** ⓘ

Pronunciation: **dis-'krēt**, 'dis-

Function: **adjective**

Etymology: Middle English, from Latin *discretus*

1 : constituting a separate entity : individually distinct

2 a : consisting of distinct or unconnected elements : **NONCONTINUOUS** b : taking on or having a finite or countably infinite number of values <*discrete* probabilities> <a *discrete* random variable>

synonym see **DISTINCT**

- *dis·crete·ly* **adverb**

- *dis·crete·ness* **noun**

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